

Some Good Problems: 1-4, 6

1b) Rationalize this Denominator. Explain.

$$\frac{1}{(2+\sqrt{10})(1-\sqrt{5})} \cdot \frac{(2-\sqrt{10})(1+\sqrt{5})}{(2-\sqrt{10})(1+\sqrt{5})}$$

2) Multiply. Explain your work.

$$\sqrt[3]{2} \cdot \sqrt{3}$$

1)  $2^{1/3} \cdot 3^{1/2}$

2)  $2^{2/6} \cdot 3^{3/6}$

3)  $\sqrt[6]{2^2} \cdot \sqrt[6]{3^3}$

4)  $\sqrt[6]{4 \cdot 27} = \sqrt[6]{108}$

1) Convert to rational exponents

2) Make like denominators  
These den. will next be like indices

3) Convert back to radical form.

4) Multiply rad.

3a) Take squared terms outside the radical and simplify if possible. Explain.

$$\begin{aligned}\sqrt{5(3-\sqrt{10})^2} &= \sqrt{5} \cdot \sqrt{(3-\sqrt{10})^2} \\&= \sqrt{5} \cdot |3-\sqrt{10}| \\&= \sqrt{5} (\sqrt{10}-3) \\&= \sqrt{50} - 3\sqrt{5} \\&= 5\sqrt{2} - 3\sqrt{5}\end{aligned}$$

3b) Take squared terms outside the radical and simplify if possible. Explain.

$$\sqrt{(4 - \sqrt{17})^2}$$

$$1) |4 - \sqrt{17}|$$

$$2) -(4 - \sqrt{17})$$

$$3) -4 + \sqrt{17}$$

1) Take the sq. rt of  
 $\sqrt{(4 - \sqrt{17})^2}$

2) Since  $4 - \sqrt{17}$  is negative, to find the abs. val. of it I take the opposite of it.

3) I took the opp. by dist. the neg.

4a) Simplify, given  $x \leq 5$

$$\sqrt{(x-5)^2} = |x-5| = -(x-5) = -x+5$$

4b) Simplify, given  $x \leq 5$

$$\sqrt{(5-x)^2(x-3)^4} =$$

$$\left| (5-x)(x-3)^2 \right| = \left| \begin{matrix} (+) & (+) \\ (5-x) & (x-3)^2 \end{matrix} \right|$$

6)

$$\left(9^{\frac{1}{2}} + 25^{\frac{1}{2}}\right)^{\frac{1}{3}}$$

$$(3+5)^{\frac{1}{3}} = (8)^{\frac{1}{3}} = 2$$